

Trend Study 21-9-98

Study site name: Wide Canyon BLM .

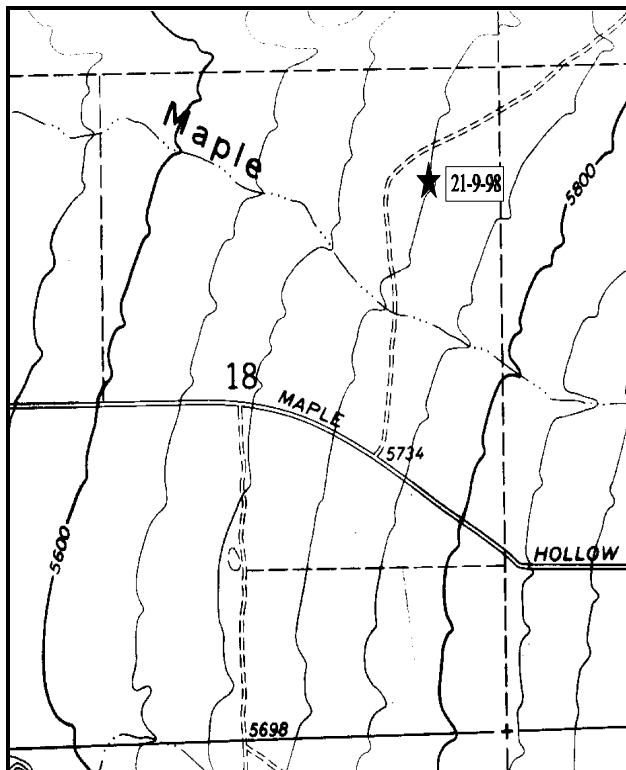
Range type: Big Sagebrush .

Compass bearing: frequency baseline 180 degrees.

Footmark (first frame placement) 5 feet. Frequency belt placement; line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

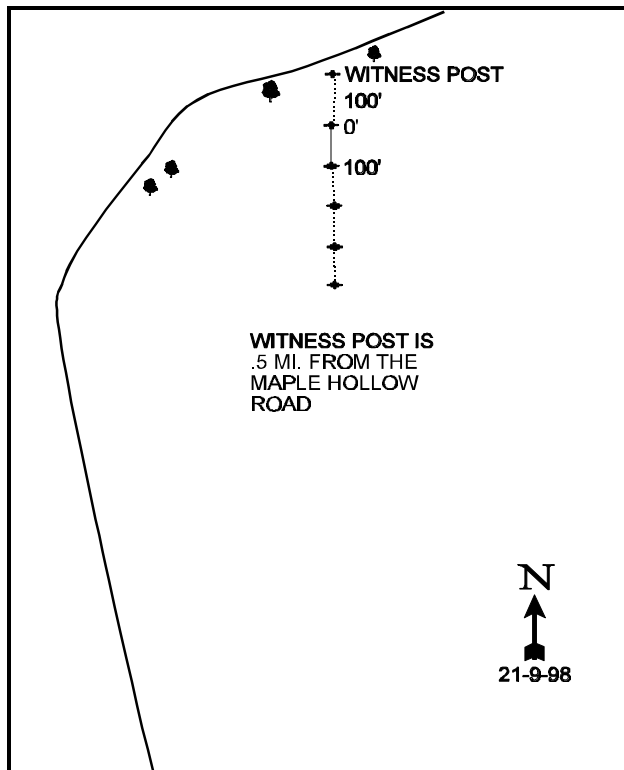
LOCATION DESCRIPTION

From exit #174 on I-15 south of Holden, go 0.9 miles east to a cattleguard. Continue 1.9 miles to a dirt road turning off to the left. Follow this dirt road 0.5 miles to a witness post (rebar) 3 feet off the right side of the road, about 10 feet beyond a juniper. The frequency baseline starts 100 feet south of the witness post. The 0-foot stake is a rebar with browse tag #7107 attached.



Map Name: Coffee Peak, Utah

Township 20S, Range 3W, Section 18



Diagrammatic Sketch

UTM 4326074.487 N, 394090.831 E

## DISCUSSION

### Trend Study No. 21-9 (41-4)

The Wide Canyon BLM study samples important deer winter range managed by the BLM in the Maple Hollow and Wide Canyon area. The study has a slight slope (2-5%) to the west and an elevation of 5,700 feet. An extensive area of this relatively flat bench was chained about 30 years ago and is now dominated by Wyoming big sagebrush and Stansbury cliffrose. Deer trend use is thought to be similar to that of nearby Lower Maple Hollow, Wild Goose pellet group transect. Over the five year period 1981-85, deer days use/acre averaged 87 (Jense et al. 1985). Between 1986 and 1991, the average deer days use/acre increased to 95 (Jense 1991). A pellet group transect read along the study site baseline in 1998 estimated 155 deer and 12 cow days use/acre. Cattle pats were old and possibly from last season. Livestock use appeared very heavy on this BLM land when compared to Division land during past readings.

The soil is very rocky, sandy, and shallow. There appears to be a hardpan at a depth of around 12 inches. Effective rooting depth (see methods) is estimated at only about 6 inches. The hardpan is likely not a rooting barrier due to the presence of deeper rooted shrubs including Wyoming big sagebrush and cliffrose. Soil texture is a sandy loam with a neutral pH (6.9). Due to the rocky nature of the soil profile, average soil temperature is extremely high at 89.6°F at a depth of almost 7 inches. A good amount of litter is found under the vegetation, but the soil cover is disjointed between shrubs leaving 24% of the surface as bare soil in 1985 and 32% in 1991. Bare ground cover declined to only 9% in 1998 primarily due to increased cheatgrass cover in the shrub interspaces. Soil movement has occurred on trails and shrub interspaces, but is minimized because of the level terrain.

The key browse species are Wyoming big sagebrush and Stansbury cliffrose. Sagebrush is the most abundant shrub at a comparatively low density of about 1,400 plants/acre estimated in 1985 and 1991. The much larger sample size used in 1998 estimated the population at 2,420 plants/acre. It is a robust sagebrush with light to moderate use. It also displays good vigor and low decadence. Young plants are common indicating the possibility of an expanding population in the future.

The cliffrose is important on this site because of its preference displayed by deer, however it only contributes 17% of the browse cover. A majority of the plants have been moderately hedged in the past. The cliffrose are vigorous and healthy with no decadent plants sampled in 1998. Population density declined since 1991 due to the larger, more representative sample utilized in 1998. Furthermore, the number of dead plants in the population can only explain 6% of the decrease. This sample better estimates shrub populations which often have aggregated and/or discontinuous populations. Young plants were common in 1985, but no young were encountered in 1998. Cliffrose will be competing in the future with the increasing broom snakeweed population and encroaching juniper which currently number 33 trees/acre. Average trunk diameter of juniper is 7 inches. Juniper overhead canopy cover averaged 6% in 1998. Actually, cheatgrass will provide much greater competition for the establishment of sagebrush and cliffrose seedlings, especially with the very high soil temperatures. Mature cliffrose have increased steadily in height and now average nearly 7 feet in height making more of these shrubs unavailable to browsing.

Herbaceous vegetation is in very poor condition. Frequency of perennial grass species is low, excluding the small Sandberg bluegrass. During past readings most of the grasses appeared to have been heavily utilized and vigor was very poor except for individuals under the protection of sagebrush crowns. Cheatgrass dominates the herbaceous understory by providing 85% of the grass cover and 78% of the total herbaceous cover. Except for a few annuals, forbs are nearly nonexistent.

## 1985 APPARENT TREND ASSESSMENT

Soil trend is essentially stable with low levels of erosion. Vegetative trend is stable to declining, as the key species compete with increasers. As far as deer winter range is concerned, the site provides good browse. However, herbaceous vegetation is severely depleted. An increase in perennial grasses and forbs would be desirable in terms of ground cover and soil protection, as well as diversity and total production of forage for livestock use. It probably will not improve significantly without reductions in grazing and/or seeding.

## 1991 TREND ASSESSMENT

Basic cover features have experienced two major downward trends: a decrease in litter cover and an increase in percent bare ground. Vegetative basal cover is still basically unchanged at 2%, which is low. These changes can most likely be attributed to the extended drought we have been experiencing since 1985, but trend for soil is still considered down. The key browse species, Wyoming big sagebrush and cliffrose show a stable trend with the exception of poor recruitment for cliffrose, which is not as critical because of its characteristics of a long life. Broom snakeweed is increasing. The trend for browse is regarded as stable. The herbaceous understory trend is stable, but still in poor condition because of poor species diversity and abundance of the annuals, cheatgrass, and bur buttercup.

### TREND ASSESSMENT

soil - down

browse - stable

herbaceous understory - stable, but still in very poor condition

## 1998 TREND ASSESSMENT

Trend for soil is up with a decline in percent bare ground from 32% in 1991 to 9% in 1998. This decline, however, appears to be due to an increase in cheatgrass cover. Litter cover has remained at similar levels while rock/pavement cover have doubled from 6% to 12%. Erosion is not currently a problem. Trend for browse is mixed. Wyoming big sagebrush appears to have a slightly upward trend due to improved recruitment, good vigor, light to moderate use and relatively low decadence. Stansbury cliffrose appears to have a slightly downward trend due to the increasing height of mature plants and lack of recruitment. Due to the lack of large numbers of dead plants, the dramatic change in density since 1991 (865 plants/acre to 180) is mostly due to the larger sample used in 1998 which better estimates shrub populations. Trend for browse is considered stable since sagebrush provides 45% of the browse cover (73% of the preferred browse) on the site and cliffrose only 17%. Trend for the herbaceous understory is stable but very poor condition. Cheatgrass and annual forbs dominate the site by providing 85% of the total herbaceous cover. Perennial grasses are depleted and growing mostly in the protection of shrub crowns.

### TREND ASSESSMENT

soil - up

browse - stable

herbaceous understory - stable, but still in very poor condition

HERBACEOUS TRENDS --

Herd unit 21 , Study no: 9

T y p e	Species	Nested Frequency			Quadrat Frequency			Average Cover % '98
		'85	'91	'98	'85	'91	'98	
G	Agropyron cristatum	19	36	24	11	15	9	.90
G	Bromus tectorum (a)	-	-	370	-	-	100	15.22
G	Poa bulbosa	-	-	3	-	-	1	.00
G	Poa secunda	<sub>b</sub> 130	<sub>ab</sub> 114	<sub>a</sub> 102	60	53	43	1.32
G	Sitanion hystrix	<sub>a</sub> 11	<sub>ab</sub> 15	<sub>b</sub> 34	5	7	14	.39
Total Annual Grasses		0	0	370	0	0	100	15.22
Total Perennial Grasses		160	165	163	76	75	67	2.63
F	Agoseris spp.	<sub>a</sub> -	<sub>b</sub> 8	<sub>a</sub> -	-	4	-	-
F	Astragalus spp.	-	-	3	-	-	1	.15
F	Calochortus nuttallii	-	4	-	-	2	-	-
F	Chenopodium spp. (a)	-	-	2	-	-	1	.00
F	Collinsia parviflora (a)	-	-	34	-	-	12	.18
F	Erodium cicutarium (a)	-	-	25	-	-	9	.12
F	Lactuca serriola	<sub>a</sub> -	<sub>b</sub> 10	<sub>a</sub> -	-	5	-	-
F	Lepidium spp. (a)	-	-	218	-	-	76	1.14
F	Microsteris gracilis (a)	-	-	18	-	-	9	.07
F	Phlox longifolia	-	1	-	-	1	-	-
F	Ranunculus testiculatus (a)	-	-	26	-	-	13	.06
F	Tragopogon dubius	-	1	2	-	1	1	.00
F	Zigadenus paniculatus	-	-	-	-	-	-	.00
Total Annual Forbs		0	0	323	0	0	120	1.57
Total Perennial Forbs		0	24	5	0	13	2	0.18

Values with different subscript letters are significantly different at % = 0.10 (annuals excluded)

## BROWSE TRENDS --

Herd unit 21 , Study no: 9

T y p e	Species	Strip Frequency '98	Average Cover % '98
B	<i>Artemisia tridentata</i> <i>wyomingensis</i>	68	9.60
B	<i>Chrysothamnus nauseosus</i> <i>albicaulis</i>	6	.56
B	<i>Cowania mexicana</i> <i>stansburiana</i>	8	3.72
B	<i>Gutierrezia sarothrae</i>	60	6.02
B	<i>Juniperus osteosperma</i>	3	1.54
B	<i>Opuntia</i> spp.	1	.00
B	<i>Purshia tridentata</i>	0	.03
Total for Browse		146	21.49

## CANOPY COVER --

Herd unit 21 , Study no: 9

Species	Percent Cover '98
<i>Juniperus osteosperma</i>	6

## BASIC COVER --

Herd unit 21 , Study no: 9

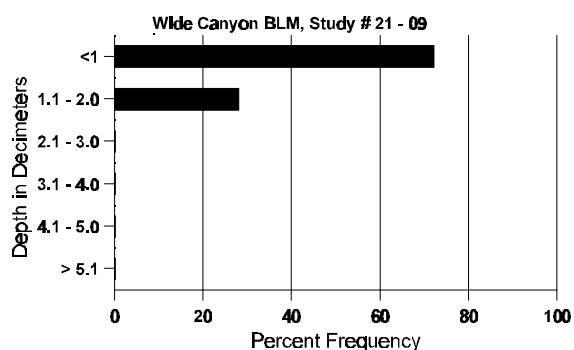
Cover Type	Nested Frequency '98	Average Cover %		
		'85	'91	'98
Vegetation	380	2.50	2.00	48.18
Rock	161	4.75	5.50	10.57
Pavement	77	.50	.25	1.12
Litter	396	68.00	59.25	56.50
Cryptogams	92	.25	.75	2.17
Bare Ground	185	24.00	32.25	9.02

## SOIL ANALYSIS DATA --

Herd Unit 21, Study # 09, Study Name: Wide Canyon BLM

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
5.8	89.6 (6.6)	6.9	56.7	25.7	17.6	2.9	18.4	163.2	.7

## Stoniness Index



### PELLET GROUP FREQUENCY --

Herd unit 21 , Study no: 9

Type	Quadrat Frequency '98
Rabbit	22
Deer	60
Cattle	1

### BROWSE CHARACTERISTICS --

Herd unit 21 , Study no: 9

A Y G R E		Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia tridentata wyomingensis																		
S	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	1	1	-	1	-	-	-	-	-	-	3	-	-	60			3
Y	85	5	1	-	-	-	-	-	-	-	6	-	-	-	400			6
	91	2	2	-	-	-	-	-	-	-	4	-	-	-	266			4
	98	21	4	-	6	-	-	-	-	-	31	-	-	-	620			31
M	85	12	-	-	-	-	-	-	-	-	12	-	-	-	800	30	33	12
	91	3	1	-	4	4	-	3	-	-	15	-	-	-	1000	29	50	15
	98	49	10	-	2	-	-	-	-	-	62	-	-	-	1240	31	39	62
D	85	3	-	-	-	-	-	-	-	-	3	-	-	-	200			3
	91	1	1	-	-	-	-	-	-	-	1	-	-	1	133			2
	98	13	14	-	-	-	-	-	-	-	20	-	1	6	540			27
X	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	540			27
% Plants Showing		<u>Moderate Use</u>				<u>Heavy Use</u>				<u>Poor Vigor</u>				<u>%Change</u>				
'85		05%				00%				00%				- 0%				
'91		38%				00%				05%				+42%				
'98		23%				00%				06%								
Total Plants/Acre (excluding Dead & Seedlings)														'85	1400	Dec:	14%	
														'91	1399		10%	
														'98	2420		23%	

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Chrysothamnus nauseosus albicaulis																		
M	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	98	5	1	-	-	-	-	-	-	-	6	-	-	-	120	29	43	6
D	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'85		00%			00%			00%										
'91		00%			00%			00%										
'98		14%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'85	0	Dec:	0%			
												'91	0		0%			
												'98	140		14%			
Cowania mexicana stansburiana																		
Y	85	2	1	-	-	-	-	-	-	-	3	-	-	-	200			3
	91	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	85	1	8	1	-	-	-	-	-	-	10	-	-	-	666	48	49	10
	91	-	-	-	4	6	-	-	-	-	10	-	-	-	666	56	58	10
	98	2	3	-	2	-	-	-	2	-	9	-	-	-	180	83	91	9
D	85	-	2	-	-	-	-	-	-	-	2	-	-	-	133			2
	91	-	1	-	1	-	-	-	-	-	2	-	-	-	133			2
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'85		73%			07%			00%			-13%							
'91		54%			00%			00%			-79%							
'98		33%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'85	999	Dec:	13%			
												'91	865		15%			
												'98	180		0%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Gutierrezia sarothrae																		
Y	85	10	-	-	-	-	-	-	-	-	10	-	-	-	666		10	
	91	9	-	-	-	-	-	-	-	-	7	2	-	-	600		9	
	98	-	-	-	5	-	-	-	-	-	5	-	-	-	100		5	
M	85	8	-	1	-	-	-	-	-	-	8	-	1	-	600	10	13	
	91	24	-	-	1	-	-	-	-	-	23	2	-	-	1666	13	16	
	98	280	-	-	1	-	-	-	-	-	281	-	-	-	5620	13	17	
D	85	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'85		00%			05%			05%			+41%							
'91		00%			00%			00%			+60%							
'98		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'85	1332	Dec:	5%			
												'91	2266		0%			
												'98	5720		0%			
Juniperus osteosperma																		
M	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
	98	1	-	-	-	-	-	-	2	-	3	-	-	-	60	-	-	
X	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'85		00%			00%			00%										
'91		00%			00%			00%										
'98		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'85	0	Dec:	-			
												'91	0		-			
												'98	60		-			
Opuntia spp.																		
S	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	91	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	98	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	85	3	-	-	-	-	-	-	-	-	3	-	-	-	200	6	8	
	91	-	-	-	1	-	-	-	-	-	1	-	-	-	66	8	15	
	98	1	-	-	-	-	-	-	-	-	1	-	-	-	20	6	12	
D	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	91	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'85		00%			00%			00%			-34%							
'91		00%			00%			00%			-85%							
'98		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'85	200	Dec:	0%			
												'91	132		50%			
												'98	20		0%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Purshia tridentata																		
M	'85	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'91	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'98	-	-	-	-	-	-	-	-	-	-	-	-	-	0	91	93	0
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
		'85			00%			00%										
		'91			00%			00%										
		'98			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'85	0	Dec:	-			
												'91	0		-			
												'98	0		-			